

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT EXAMINING OPERATIONS**

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Applicant: Fumio Suzuki et al.

Title: CHARGING APPARATUS, CHARGING METHOD, CHARGING SYSTEM,
AND RECORDING MEDIUM ONTO WHICH IS RECORDED A CHARGING
METHOD

Attorney Docket: 180640

Examiner: N/A

Unit: N/A

Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Dear Sir:

Prior to the examination of the application filed herewith, please amend the claims
as follows:

In the Claims:

3. A secondary cell charging apparatus according to claim [1 or] 2, wherein said PC
is selected from a group of a general-purpose PC including a desktop PC, a laptop PC,
a mobile type PC, a dedicated game-use PC, and a TV PC with a bi-directional
communication capability.

4. A secondary cell charging apparatus according to [any one of] claim[s 1 to 3] 2, wherein said charger is either a charging processing operation program required for a charging operation on a secondary cell or is an apparatus into which a charging processing operation program required for a charging operation to a secondary cell is built.

5. A secondary cell charging apparatus according to [any one of] claim [1 to claim 4] 2, wherein said charger is provided within said PC or provided external thereto.

6. A secondary cell charging apparatus according to [any one of] claim [1 to claim 5] 2, wherein said charger is connected to a battery holding apparatus, which holds at least a secondary cell requiring charging processing.

7. A secondary cell charging apparatus according to [any one of] claim [1 to claim 5] 2, wherein said PC is provided with a driving controlling program for driving a charging controlling program installed in said charger.

8. A secondary cell charging apparatus according to [any one of] claim 1 [to claim 7], wherein said apparatus configured so that by operating a controlling-condition-inputting means consisting of either a key-board or a mouse of a PC, at least one of information selected from a group of charging processing information, charging processing condition, information of a battery to be charged, situation of charging process proceeding, charging history or the like is selected so as to make a control based upon the selected information and the result thereof being displayed on said display means of said PC.

9. A secondary cell charging apparatus according to [any one of] claim [1 to claim] 8 wherein said charging processing operation program is made separately based upon kinds of batteries, models thereof or applications thereof, respectively

10. A secondary cell charging apparatus according to [any one of] claim [1 to claim 9] 2, wherein an apparatus that forms the charger which is selected from a group consisting of an international PCI (PC interface) standard selecting from either one of a PCI board or PCI card each including said charging processing operation program therein, an IC chip mounted on an expansion board or the like, a CD-ROM, a floppy disk, an IC card each including said charging processing operation program therein and a PC hard disk (HD) onto which said charging processing operation program has been installed.

11. A secondary cell charging apparatus according to [any one of] claim [1 to claim 10] 2, wherein said charger is connected detachably to any one of output terminals of said internal power supply circuit of said PC, and is further connected either directly or indirectly, by an appropriate connector and/or cable to said battery holding apparatus.

12. A secondary cell charging apparatus according to [any one of] claim [1 to claim 11] 2, wherein said charger is connected to said power supply circuit of said PC through an internationally standardized interface such as a PCI or a USB of said PC.

13. A secondary cell charging apparatus according to [any one of] claim [1 to claim 12] 6, wherein said battery holding apparatus is connected to said charger provided with a chip into which said charging processing operation program being installed therein and mounted

on a board which is inserted into a board insertion slit of said PC, through an appropriate connector and/or cable.

14. A secondary cell charging apparatus according to [any one of] claim [1 to claim] 13, wherein in a case in which said charger is provided within said PC, said charger is connected to said internal power supply circuit of said PC, and is connected to said battery holding apparatus either directly via a signal output of said PC, or indirectly connected thereto, via a signal output of said PC, utilizing an appropriate connector and/or cable.

15. A secondary cell charging apparatus according to [any one of] claim [1 to claim] 13, wherein in a case in which said charger is provided outside of said PC, said charger is connected to said internal power supply circuit of said PC through said board inserted into said board insertion slit or through said USB connector provided with said PC.

16. A secondary cell charging apparatus according to [any one of] claim [1 to claim] 15, wherein said international PCI (PC interface) standard selecting from either one of a PCI board or PCI card, each including said charging processing operation program therein, an IC chip mounted on an expansion board or the like, a CD-ROM, a floppy disk, an IC card each including said charging processing operation program therein or a PC hard disk (HD) onto which said charging processing operation program has been installed, is individually produced based upon kinds of batteries, model thereof, applications therefor, or the like, respectively.

17. A secondary cell charging apparatus according to [any one of] claim [1 to claim 16] 6, wherein, said battery holding apparatus includes a holder part configured so as to enable acceptance and a charging processing operation separately on one or a plurality of secondary cell of various sizes requiring charging processing.

18. A secondary cell charging apparatus according to [any one of] claim [1 to claim] 17, wherein said battery holding apparatus includes a stand part configured so as to enable acceptance and a charging processing operation of a cell package in which a plurality of secondary cell of the same size being packaged therewithin, or directly of a cellular telephone with said pack built thereinto, directly.

19. A secondary cell charging apparatus according to claim [17 or claim] 18, wherein said secondary cell holder part or stand part thereof is formed so as to match the dimensions or shape of each individual secondary cell.

20. A secondary cell charging apparatus according to claim [18 or claim] 19, wherein said secondary cell holder part or stand part is formed so as to match the dimensions or shape of all said secondary cells.

21. A secondary cell charging apparatus according to [any one of claim 1 to] claim 20, wherein said secondary cell charging processing operation program executes high-speed charging processing.

22. A secondary cell charging apparatus according claim 21, wherein said secondary cell charging processing operation program executes charging with a charging current of at least 2C.

24. A secondary cell charging apparatus according to [any one of claim 1 to] claim 23, [wherein] wherein each of said charging processing operation program is created so as to have a respective charging process operation condition of a secondary cell to be subjected to charging processing, being different from each other based upon at least one factor among a secondary cell manufacturer name, secondary cell type, model, construction, quantity, battery capacity, and internal resistance and the like .

25. A secondary cell charging apparatus according to [any one of claim 1 to] claim 24, wherein said charging processing operation program has a function to distinguish at least one information selected from a group of information consisting a manufacturer name, secondary cell type, model, construction, quantity, battery capacity, and internal resistance and the like of a secondary cell requiring charging processing inserted in said battery holding apparatus.

27. A secondary cell charging apparatus according to [any one of claim 1 to] claim 26, wherein information regarding a secondary cell requiring charging processing and inserted into said battery holding apparatus is displayed on a display means of said PC.

28. A secondary cell charging apparatus according to [any one of] claim [1 to claim 27] 24, wherein a user uses an appropriate input means associated with said PC to input information regarding a secondary cell requiring charging processing inserted in said battery holding apparatus, said information being displayed on a display means of said PC.

29. A secondary cell charging apparatus according to [any one of] claim [1 to claim 28] 26, wherein when a user uses an appropriate input means associated with said PC to input

information regarding a secondary cell requiring charging processing inserted in said battery holding apparatus and display said information on said display means of said PC in a case in which at least one information being different from information regarding a secondary cell requiring charging processing inserted in said battery holding apparatus is input, an alarm means is driven.

30. A secondary cell charging apparatus according to [any one of] claim [1 to claim 29] 24, wherein a user, based on information regarding a secondary cell requiring charging processing, sets various conditions necessary to be required for charging said secondary cell by selecting same from a large number of alternatives displayed on a display screen of said PC.

31. A secondary cell charging apparatus according to [any one of] claim [1 to claim 30] 24, wherein a predicted charging characteristics graph with regard to charging operation conditions for said selected secondary cell requiring charging processing can be displayed on said display means of said PC.

32. A secondary cell charging apparatus according to [any one of] claim [1 to claim] 31, wherein said predicted charging characteristics graph indicates a relationship between a battery voltage and a charging time or a relationship between a battery temperature and a charging time.

33. A secondary cell charging apparatus according to [any one of] claim [1 to claim 32] 24, wherein a display means of said PC displays at least one information selected from a manufacturer name, a battery type, battery capacity, charging rate, and internal

resistance and the like with regard to charging operation conditions for said selected secondary cell requiring charging processing, and displays information in that whether it distinguishes the start of charging or charging in progress.

34. A secondary cell charging apparatus according to [any one of] claim [1 to claim 33] 24, wherein a display means of said PC displays at least one information selected from a manufacturer name, a battery type, battery capacity, charging rate, and internal resistance and the like with regard to charging operation conditions for said selected secondary cell requiring charging processing, and separately displays either one of the start of charging or charging in progress and wherein said display means displays either a separate display of a battery voltage and battery temperature, which vary with the elapse of processing time, or a graph indicating a relationship between a battery voltage and a charging time or a relationship between a battery temperature and a charging time.

35. A secondary cell charging apparatus according to [any one of claim 1 to] claim 34, wherein a notification means is provided which, after a start of a prescribed charging processing operation under selected charging conditions with respect to a selected secondary cell requiring charging processing, in a case in which said charging operation is completed, makes notification to a user of said completion.

36. A secondary cell charging apparatus according to [any one of claim 1 to] claim 35, wherein said charging processing operation program has separate settings of charging processing conditions for all secondary cell currently existing to be subjected to charging processing, respectively.

37. A secondary cell charging apparatus according to [any one of claim 1 to] claim 36, wherein said charging processing operation program is created that is suitable for charging processing of a new secondary cell each time a new secondary cell is marketed, said program being added to an existing charging processing operation program by updating processing.

38. A secondary cell charging apparatus according to [any one of claim 1 to] claim 37, wherein any one of a PCI board or PCI card each forming said PCI interface, a floppy disk, a CD-ROM, or an IC card each of which containing said updated charging processing operation program is distributed to a user for a fee or free-of-charge, said user updating said charging processing operation program in his or her PC with said new charging processing operation program.

39. A secondary cell charging apparatus according to [any one of] claim [1 to claim 38] 37, wherein said updated charging processing operation program is distributed to a user via a communication system including such as the Internet.

45. A charging system according to [any one of claim 41 to] claim 43, wherein said charging processing operation program is built into said PC by inserting a floppy disk, a CD-ROM, or an IC card each containing said charging processing operation program therein, into a prescribed location of said PC, or by inserting a PCI board onto which an IC chip or PCI card each containing said charging processing operation program has been mounted into an expansion slot of said PC.

46. A charging system according to [any one of claim 41 to] claim 45, wherein said charger is connected detachably to any one of output terminals of said internal power supply circuit of said PC, and is further connected either directly or indirectly, by an appropriate connector and/or cable to said battery holding apparatus.

updated charging processing operation program is distributed

47. A charging system according to [any one of claim 41 to] claim 46, wherein said charger is connected to said power supply circuit of said PC through an internationally standardized interface such as a PCI or a USB of said PC.

49. A charging system according to [any one of claim 41 to] claim 48, wherein said charging processing operation program has a function to distinguish at least one information selected from a group of information consisting of a manufacturer name, secondary cell type, model, construction, quantity, battery capacity, and internal resistance and the like of a secondary cell requiring charging processing inserted in said battery holding apparatus, and further wherein said program having a function in that said distinguished information about said secondary cell battery is displayed on said display means.

50. A charging system according to [any one of claim 41 to] claim 49, wherein said input means is used to display on said display means information regarding a secondary cell requiring charging processing inserted into said battery holding apparatus.

51. A charging system according to [any one of claim 41 to] claim 50, wherein a user, based on information regarding a secondary cell requiring charging processing, sets

various conditions necessary to be required for charging said secondary cell by selecting same from a large number of alternatives displayed on a display screen of said PC.

52. A charging system according to [any one of claim 41 to] claim 51, wherein, from information regarding said secondary cell requiring charging processing recognized by said PC, or from information regarding said secondary cell requiring charging processing input by a user via said input means, a charging processing operation program having charging processing conditions most suited for said secondary cell required charging processing is selected from a plurality of charging processing operation programs stored within said charger.

53. A charging system according to [any one of claim 41 to] claim [52] 49, wherein either various information regarding optimum charging operation conditions for a selected secondary cell requiring charging processing or a predicted charging characteristics graph with regard to charging operation conditions for said selected secondary cell requiring charging processing can be displayed on said display means of said PC.

55. A charging system according to [any one of claim 41 to] claim 54, wherein a display means of said PC displays a battery type, battery capacity, charging rate, and internal resistance and the like with regard to charging operation conditions for said selected secondary cell requiring charging processing, and displays whether it distinguishes the start of charging or charging in progress, and further displays during said charging operation on said secondary cell either a separate display of a battery voltage and battery temperature, which vary with the elapse of processing time, or a graph indicating a

relationship between a battery voltage and a charging time or a relationship between a battery temperature and a charging time.

56. A charging system according to [any one of claim 41 to] claim 55, wherein a notification means is provided which, after a start of a prescribed charging processing operation under selected charging conditions with respect to a selected secondary cell requiring charging processing, in a case in which said charging operation is completed, makes notification to a user of said completion.

57. A charging system according to [any one of claim 41 to] claim 56, wherein said charging processing operation program has a separate settings of charging processing conditions for all secondary cell currently existing to be subjected to charging processing ,respectively.

58. A charging system according to [any one of claim 41 to] claim 57, wherein said charging processing operation program is created that is suitable for charging processing of a new secondary cell each time a new secondary cell is marketed, said program being added to an existing charging processing operation program by updating processing.

59. A charging system according to [any one of claim 41 to] claim 58, wherein any one of a PCI board or PCI card each forming said PCI interface, a floppy disk, a CD-ROM, or an IC card each of which containing said updated charging processing operation program is distributed to a user for a fee or free-of-charge, said user updating said charging processing operation program in his or her PC with said new charging processing operation program.

60. A charging system according to [any one of] claim [41 to claim 59] 58, wherein said updated charging processing operation program is distributed to a user via a communication system such as the Internet.

61. A charging system according to [any one of] claim 60, wherein after a user, by means of a pre-established method, made a payment for said charging processing operation program for updating, said user downloads said charging processing operation program via the Internet, and updates said charging processing operation program in his or her PC with said new charging processing operation program.

64. A secondary cell charging method according to [claim 62 or] claim 63, wherein either the secondary cell holder part or stand part is formed so as to match the dimensions or shape of each individual secondary cell.

65. A secondary cell charging method according to [any one of claim 62 to] claim 64, wherein said charger connected to said PC has built into it a charging processing operation program required for charging of said secondary cell.

66. A secondary cell charging method according to [any one of claim 62 to] claim 65, wherein said charger performs control of current from an internal power supply circuit of said PC in accordance with said charging processing operation program, so as to execute charging processing with respect to a secondary cell requiring charging processing.

67. A secondary cell charging method according to [any one of claim 62 to] claim 66, wherein said secondary cell charging processing operation program executes high-speed charging processing.

68. A secondary cell charging method according to claim 67, wherein said high-speed charging processing is executed with a charging current of at least 2C.

69. A secondary cell charging method according to [any one of] claim [62 to claim 68] 66, wherein said charging processing operation program included in said charger is either built into said PC by inserting a floppy disk, a CD-ROM, or an IC card containing said charging processing operation program into a prescribed location of said PC, or by inserting a PCI board or expansion board including an IC chip and PCI card therein each of which containing said charging processing operation program therein has been mounted into an expansion slot of said PC.

70. A secondary cell charging method according to [any one of] claim 53 [to claim 60], wherein said charging processing operation program has mutually different charging processing conditions from each other as set for at least one factor among a secondary cell manufacturer name, secondary cell type, model, construction, quantity, battery capacity, and internal resistance and the like of a secondary cell to be subjected to charging processing.

71. A secondary cell charging method according to [any one of claim 62 to] claim 70, wherein said charging processing operation program distinguishes at least one part of a manufacturer name, secondary cell type, model, construction, quantity, battery capacity, and internal resistance and the like of a secondary cell requiring charging processing and also displays said information on a display means of said PC.

72. A secondary cell charging method according to [any one of claim 62 to] claim 71, wherein user uses an appropriate input means associated with said PC to input information regarding a secondary cell requiring charging processing and inserted in said holder part or said stand, said information being displayed on a display means of said PC.

73. A secondary cell charging method according to [any one of claim 62 to] claim 72, wherein a user, based on information regarding a secondary cell requiring charging processing sets various conditions necessary to be required for charging said secondary cell by selecting same from a large number of alternatives displayed on a display screen of said PC.

74. A secondary cell charging method according to [any one of] claim [62 to claim 73] 70, wherein in said PC, from information regarding said secondary cell requiring charging processing recognized by said PC, or from information regarding said secondary cell requiring charging processing input by a user via said input means, a charging processing operation program having charging processing conditions most suited for said secondary cell required charging processing is selected from a plurality of charging processing operation programs stored within said charger, and displayed on said display means.

75. A secondary cell charging method according to [any one of claim 62 to] claim 74, wherein a predicted charging characteristics graph with regard to charging operation conditions for said selected secondary cell requiring charging processing is displayed on said display means of said PC.

76. A secondary cell charging method according to [any one of claim 62 to] claim 75, wherein said predicted charging characteristics graph indicates a relationship between a battery voltage and a charging time or a relationship between a battery temperature and a charging time.

77. A secondary cell charging method according to [any one of claim 62 to] claim 76, wherein a display means of said PC displays at least one of a name of a battery manufacturer, a kind of battery, a battery type, battery capacity, quantity thereof, a capacitance thereof, charging rate, a charging power supply and internal resistance and the like with regard to charging operation conditions for said selected secondary cell requiring charging processing, and a display that distinguishes between the start of charging and charging in progress, and further displays during said charging operation on said secondary cell either a separate display of a battery voltage and battery temperature, which vary with the elapse of processing time, or displays a graph indicating a relationship between a battery voltage and a charging time or a relationship between a battery temperature and a charging time.

78. A secondary cell charging method according to [any one of claim 62 to] claim 77, wherein a notification means is provided which, after a start of a prescribed charging processing operation under selected charging conditions with respect to a selected secondary cell requiring charging processing, in a case in which said charging operation is completed, makes notification to a user of said completion.

79. A secondary cell charging method according to [any one of claim 62 to] claim 78, wherein said charging processing operation program has a separate settings of charging

processing conditions for all secondary cell currently existing to be subjected to charging processing, respectively.

80. A secondary cell charging method according to [any one of claim 62 to] claim 79, wherein said charging processing operation program is created that is suitable for charging processing of a new secondary cell each time a new secondary cell is marketed, said program being added to an existing charging processing operation program by updating processing.

81. A secondary cell charging method according to [any one of claim 62 to] claim 80, wherein any one of a PCI board or PCI card each forming said PCI interface, a floppy disk, a CD-ROM, or an IC card each of which containing said updated charging processing operation program is distributed to a user for a fee or free-of-charge, said user updating said charging processing operation program in his or her PC with said new charging processing operation program.

82. A secondary cell charging method according to [any one of] claim [62 to claim 81] 80, wherein said updated charging processing operation program is distributed to a user via a communication system such as the Internet.

84. A secondary cell charging method according to [any one of claim 62 to] claim 83, wherein past charging processing information with respect to each individual secondary cell is stored as historical information.

89. A charging method according to [any one of claim 62 to] claim 88, wherein a provider of said charging processing operation program discloses optimum charging

processing conditions or a charging processing operation program for a prescribed secondary cell on a web page via the Internet, so that any user can access said provider of said charging processing operation program and receive distribution of said charging processing operation program via said Internet.

90. A method for charging according to [any one of claim 62 to] claim [89] 88, wherein a provider of said charging processing operation program discloses optimum charging processing conditions or a charging processing operation program for a prescribed secondary cell on a web page via the Internet, and wherein a user executes placement of an order and remittance of payment therefor via said Internet, whereupon a floppy disk, CD-ROM, IC card, or expansion board onto which is installed an IC chip containing said charging processing operation program required for execution thereof is sent to said user.

91. A charging method according to [any one of claim 62 to] claim [90] 88, wherein a provider of said charging processing operation program discloses optimum charging processing conditions or a charging processing operation program for a prescribed secondary cell on a web page via the Internet that is at all times the latest optimum charging processing conditions or the latest charging processing operation program, so that a user can execute placement of an order and remittance of payment therefor via the Internet, enabling said user to download said latest charging processing conditions or said latest charging processing operation program to his or her PC, thereby maintaining a latest charging processing operation environment on his or her PC.

92. A storage medium onto which is stored a program for the purpose of causing a computer to execute a charging method recited in [any one of] claim 86 [to claim 91].

93. A secondary cell charging apparatus according to [any one of] claim [1 to claim 92] 2, wherein said charger selected from a group consisting of an international PCI (PC interface) standard selecting from either one of a PCI board or PCI card each including said charging processing operation program therein ,an IC chip mounted on an expansion board or the like, a CD-ROM, a floppy disk, an IC card each including said charging processing operation program therein and a PC hard disk (HD) onto which said charging processing operation program has been installed, is formed a kit with a predetermined battery holder means and a predetermined operation manual of said charger so as to be sold publicly.

REMARKS


The claims have been amended to eliminate multiple dependent claims. No new matter has been added. Please charge any additional fees associated with this amendment to deposit account 08-0865.

Respectfully submitted,



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